EMITTER ELECTRONICS

MMXEC2

HIGH POWER **SUPERSTRUCTURE** CONTROL PLATFORM

120A | 136 PINS

260513R3

The MMX EC2 is a cutting-edge, highly configurable controller designed to provide reliable control solutions for special vehicles, machinery, and industrial automation systems. With its expansive **120A current handling** capacity, **93 I/O ports**, and variety of input/output configurations, the MMX EC2 offers exceptional flexibility, superior reliability, and efficient power management for high-performance automation and control.

Seamless **CAN bus integration** is supported with three CAN ports compatible with **CAN SAE J1939**, **CANopen**, or custom protocols. This allows the MMX EC2 to interface smoothly with a wide range of devices, including **HMIs**, **keypads**, and other **MMX family products** like the **MMX EC1**.

Programming is made easy with **C/C++ compatibility** and a **high-level API library** included, giving you complete control over system functionality and making the MMX EC2 the ultimate solution for complex control requirements.

MMX EC2 Controller Features & Benefits

120 A Total Current Capacity
Designed to handle high-power applications, the MMX EC2 provides a robust total current capacity of 120 amps, making it ideal for demanding automotive and industrial systems.

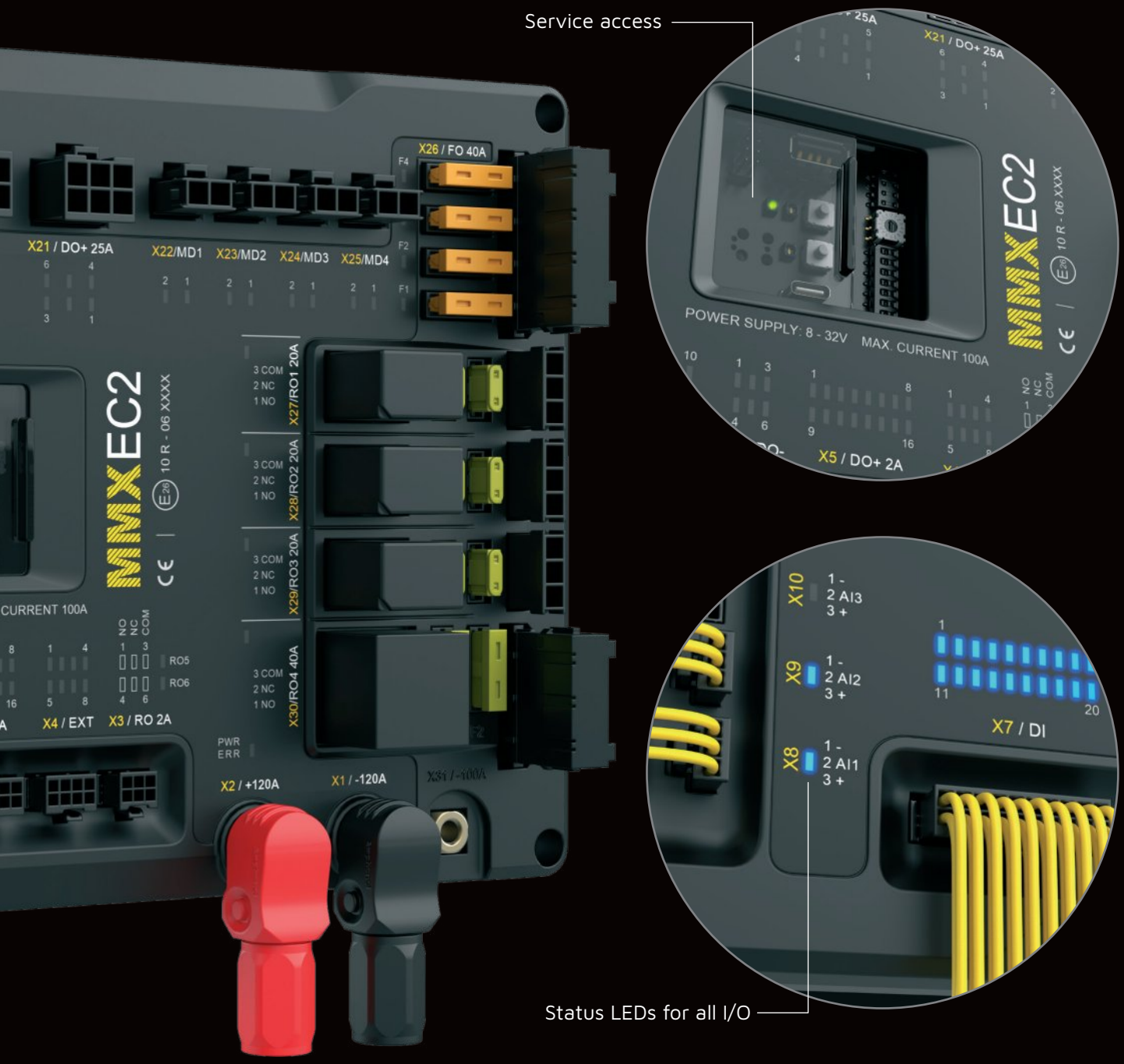
93 I/O Ports Total
With an impressive total of 93 Input/Output (I/O) ports, the MMX EC2 controller offers unmatched flexibility and scalability for a wide range of applications.

Integrated Fused Outputs
Provides built-in protection to safely supply additional power to connected device.

27 Inputs total
Supports digital, analog, resistance, or frequency signals.

66 Outputs total
Includes 14 x 25A high-power outputs, 4 x 20A integrated motor driver outputs, 12 x 8A and 16 x 2A high side outputs, 6 low-side outputs, PWM outputs. Four of the 2 A outputs can optionally be equipped with precise current measurement capability.

Integrated Power Relay Outputs
Direct integration of power relay outputs eliminates the need for additional external components, simplifying the overall system design.



Current Measurement with Load Shedding Function
Smart current measurement and load shedding help optimize energy distribution

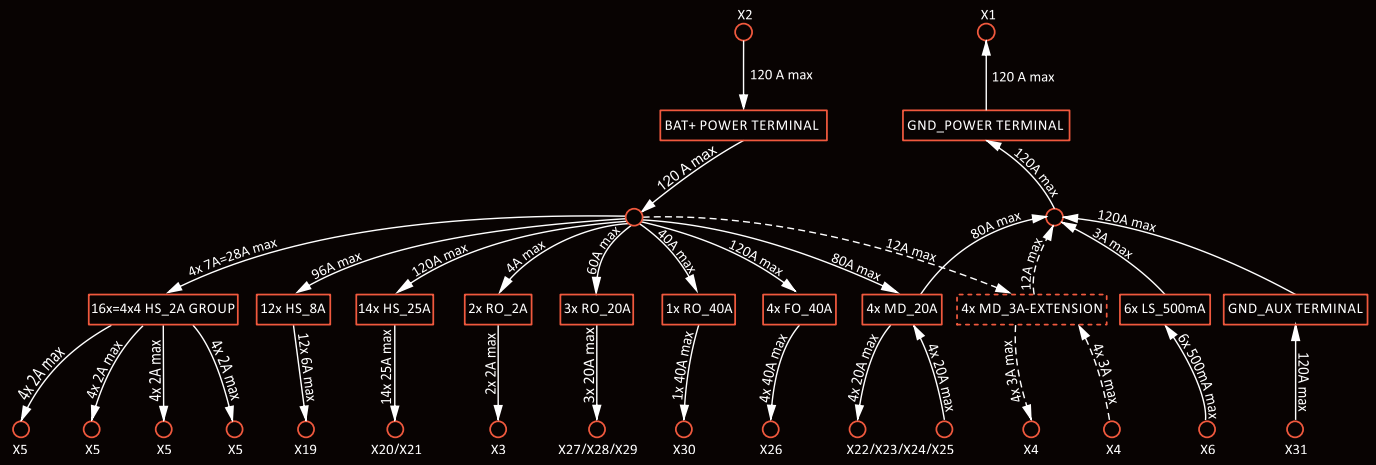
Optional 3-axis Accelerometer
An optional built-in 3-axis accelerometer provides advanced sensing capabilities for motion-based applications, adding a new layer of functionality.

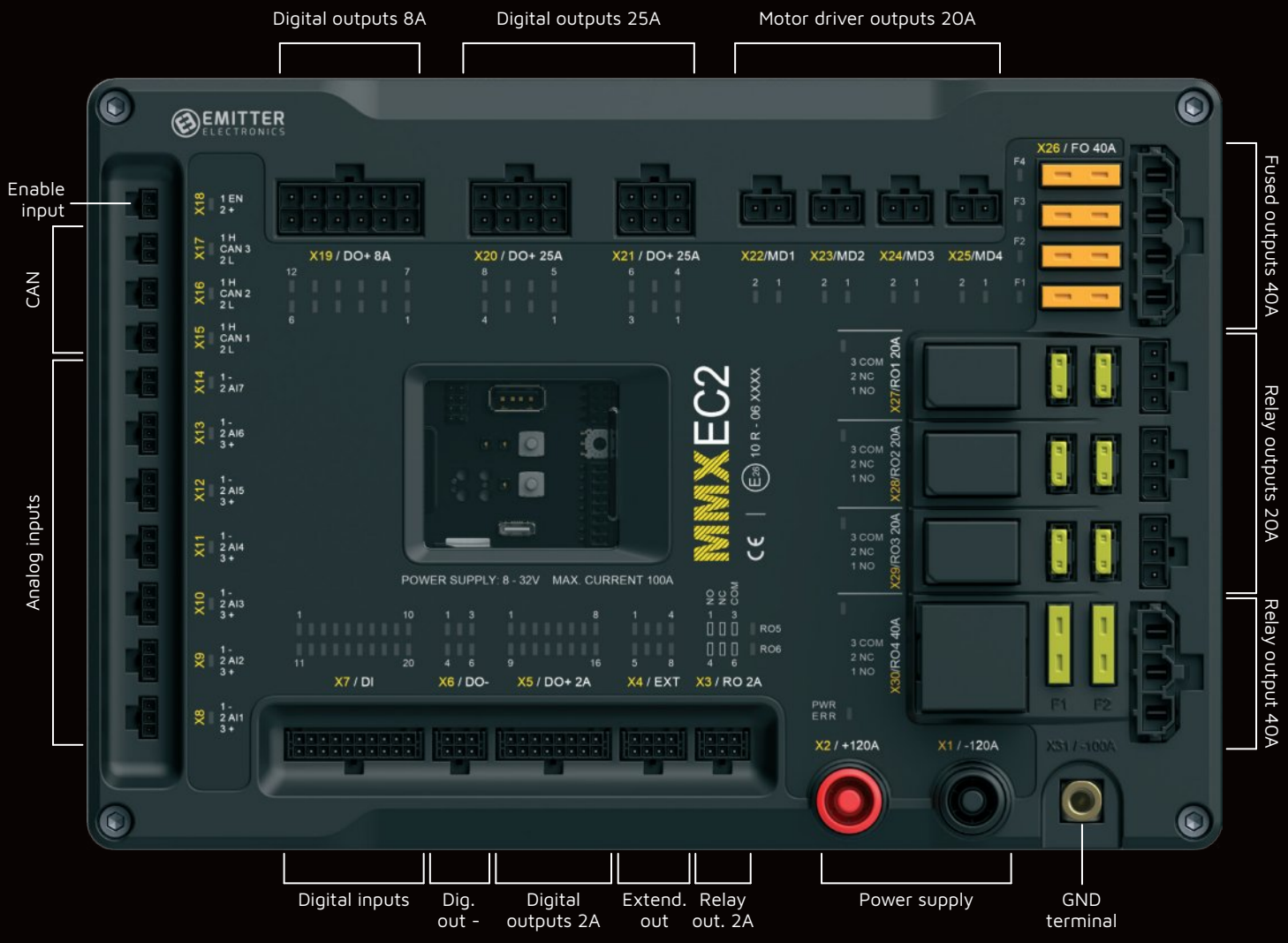
Status LEDs for all I/O
The MMX EC2 is equipped with status LEDs for every I/O port, allowing easy visual diagnostics and system monitoring.

3 Individual CAN Bus Ports
Three CAN bus ports offer seamless communication with a variety of CAN-based devices, including those using CAN SAE J1939, CANopen, or custom protocols.

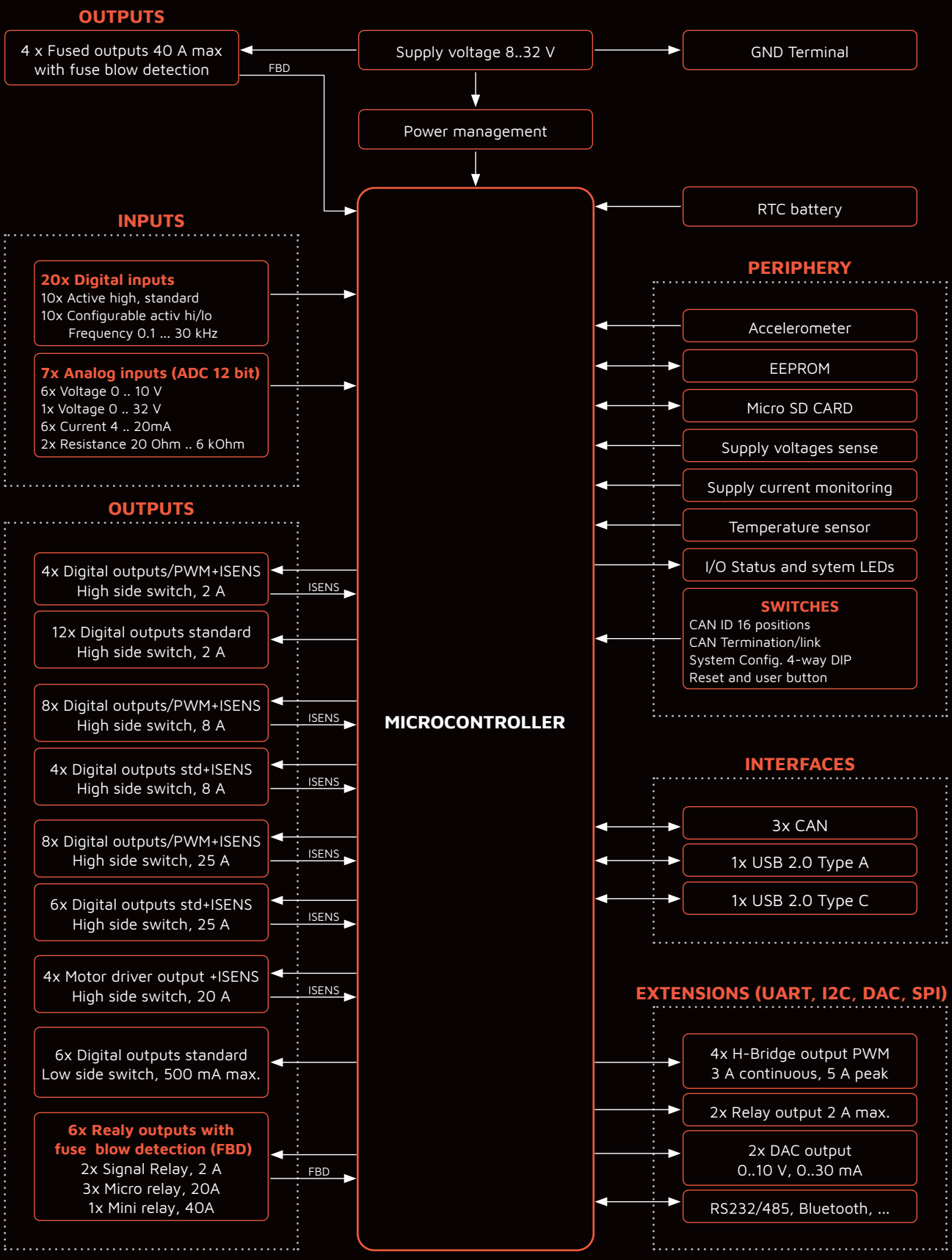
Extension Options
Extend the MMX EC2's capabilities with additional modules such as H-Bridge motor drivers, IMUs (Inertial Measurement Units), DACs (Digital to Analog Converters), RS232/485 serial communication ports, and more.

Output Current Diagram

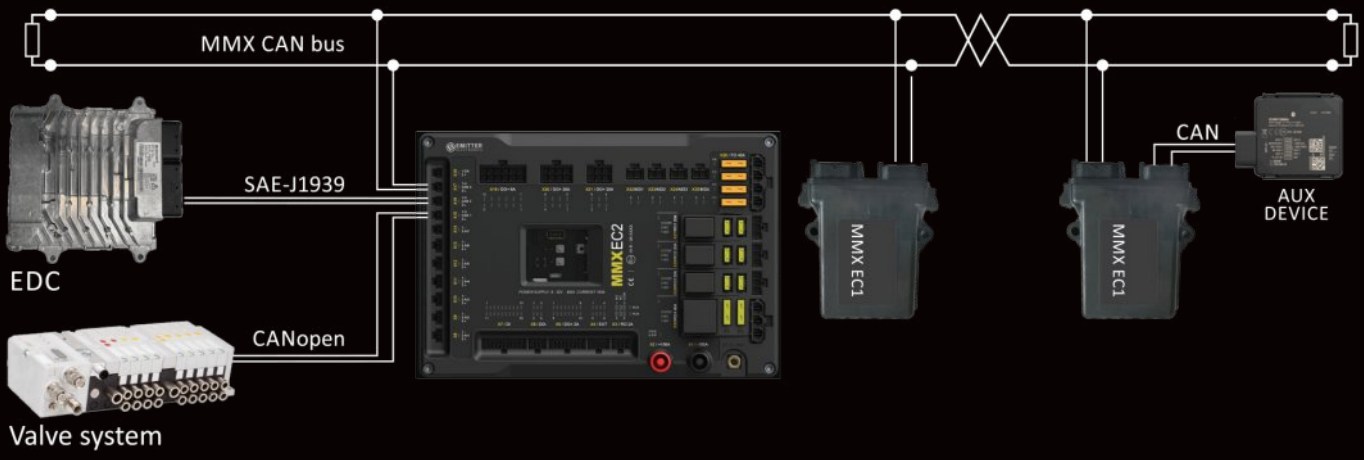




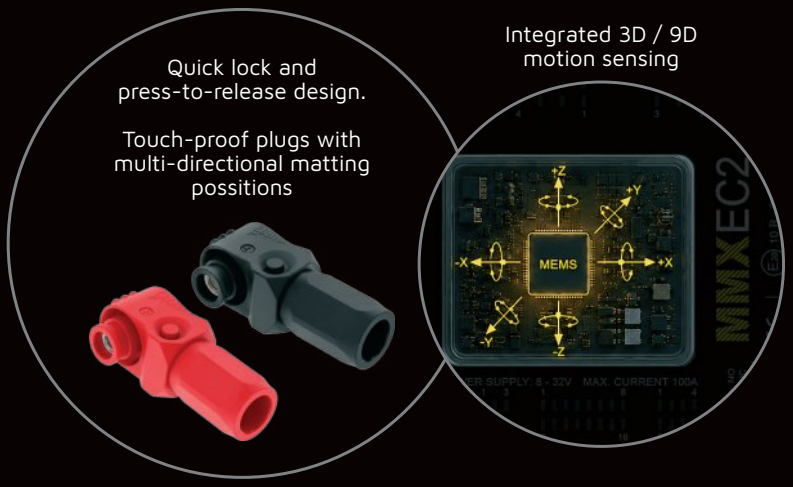
Block Diagram



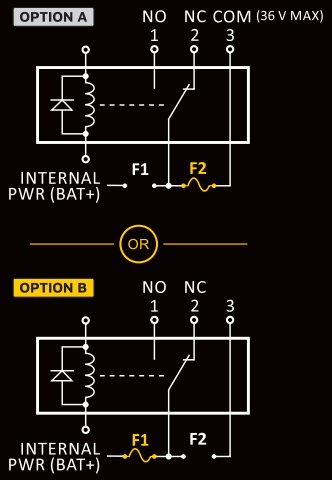
MMX topology example



Additional features



EC2 RELAY CONNECTIONS
Only one fuse location shall be used (F1 or F2)



Specifications

POWER	
Supply Voltage	8-32 V DC
Peak supply voltage	≤ 36 V for ≤ 5 min, ≤ 40 V for ≤ 2 s.
Idle power	< 2 W
Current total	120 A max.
Electrical Protection	overvoltage, transients, overcurrent, load dump, reverse polarity protection by external fuse

KERNEL	
Processor	32-bit ARM Cortex-M7, 216 MHz
Processor flash	2 MBytes
Processor SRAM	512 kBytes
External EEPROM	2 kByte

INTERFACES	
CAN	3x CAN, node ID definition via 16 positions rotary switch
CAN link	T-connection, configurable termination 120 ohm via DIP switch
USB A	Firmware update
USB C	accessing to device via Command-Line-Interface (CLI)
Micro SD card	Data storage, optional
JTAG connect	Programming
RS232/485, Bluetooth,...	Available via extension boards

SOFTWARE	
Programming enviroment	C/C++, high level API-library included

ENVIRONMENT	
IP CLASS (IEC529)	IP20
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference ISO 7637-2 pulse immunity, load dump
Temperature Range	storage from -40° to +85°C (-40°F to 185°F) operating from -40° to +85°C (-40°F to 185°F

INPUTS	
Digital inputs	20x total, GND and BAT+ protected
Active high	10x active high levels, integ. pull-down resistor
Configurable	10x configurable, integrated pull-up/ down resistor and active low/high levels via SW
Analog Inputs	7x total (6 configurable), ADC 12bit
Voltage/current	6x configurable, 0 .. 10V or 0 .. 20 mA
Resistance	2x resistance 30 ohm .. 5 kOhm
Batt Voltage	1x 0 .. Batt+ V

OUTPUTS	
Digital Outputs	total current 120A max., protection from short circuit and overload, open load detection
Loads	Inductive, capacitive, resistive
2A	16x 2A high side, 4 with precise Isense, optional
8A	12x 8A high side outputs, PWM, Isense
25A	14x 25A high side outputs, PWM, Isense
0.5A	6x 500 mA low side outputs
H-Bridge	4x 20A motor driver outputs, Isense 4x 3A continuous, 5A peak, via extension board
Relay outputs	Fused 2x, with FB detection
Micro relays	3x 20A max., fused with two mini fuses
Mini relay	1x 40A max., fused with two ATO fuses
Signal relays	2x 2A max. + 2x 2A via extender board
Fused outputs	4x 40A max. with FB detection
DAC outputs	2x total, 12-bit resolution, 0 .. 10 V (<10 mA) or 0 .. 30 mA, protected, available via extension board

OTHER FEATURES	
Accelerometer	integrated 3-axis, MEMS, 12-bit digital accelerometer, +/-2, +/-4, +/-8 g, for inclination/acceleration sensing
IMU*	3-axis accelerometer 12-bit, 3-axis gyroscope 16-bit, 3-axis magnetometer 16-bit, available via extension board
Data logger*	system information/data logging - micro SD card, optional RTC, logging with dedicated 1000 mAh onboard battery
Monitoring	Supply current, supply voltage, CPU core temperature and board temperature, watchdog functionality
Status LEDs	I/O status LEDs for all I/O pin, diagnostics, system status, power error indication
Switches	System Config. 4-way DIP, reset button, user button

ENCLOSURE	
Housing Material	Aluminium + PA
Mounting	4 holes 5.4 mm diameter
Mating Connector	120A: Surlock Plus for wire 16 - 25 mm2 40A: Mini Fit Sr. for wires 4 - 8 mm2 8A - 25A: WR-MCP5 for wires 2.5-4 mm2 2A: WR-MCP3 for input and low-current signal, wires 0.5 mm2

SIZE AND WEIGHT	
W x H x D	280 x 190 x 40 mm w/o mating conn.
Indicator Weight	1.85 kg

*TBD

Product codes

Intercom master/slave unit — Ordering code example:

M	M	X	E	C	2	-	R	M	H	A			-	0	0
SYSTEM		CONTROLLER TYPE					**R**: 4x POWER RELAYS	**M**: 4x H-BRIDGES 20A	**H**: +6 x HS OUTPUTS 25A	A: ACCEL-EROMETER	ADDITIONAL FEATURES / MODIFICATIONS			PRODUCT VERSION	

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